

DOCUMENT RESUME

ED 412 242

TM 027 491

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TITLE Using Structured Interactions in Conferences and Journals To Promote Cognitive Development among Mentors and Mentees.
PUB DATE 1997-03-00
NOTE 39p.; Paper presented at the Annual Meeting of the American Educational Research Association (Chicago, IL, March 24-28, 1997).
PUB TYPE Reports - Research (143) -- Speeches/Meeting Papers (150)
EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Adults; *Cognitive Development; Conferences; *Graduate Students; Higher Education; Instructional Leadership; *Interaction; Interpersonal Relationship; *Mentors; Moral Values; Responses; *Student Journals; Supervision; Supervisors; Thinking Skills
IDENTIFIERS *Protege Mentor Relationship

ABSTRACT

A study was conducted to examine the effects of structured interactions in conferences and journals on the cognitive complexity of adult educators. The specific focus was the effects of the use of specific dialogue patterns within reflective conversations and of structured response patterns in journals on the cognitive processes of mentors and mentees engaged in conferences about the professional practices of the mentees. In the 1995-96 school year students in a graduate class in educational leadership participated as part of their course work. Eleven pairs of educators completed the project. Each pair consisted of a student and a partner from the student's work site. Some pairs were an administrator and a teacher; others were closer to being true peers as teachers. The Rest Defining Issues Test (J. Rest, 1986) was used to assess changes in the level or complexity of principled moral reasoning of mentors and mentees involved in the project, and the Schommer Epistemological Survey (M. Schommer, 1989) was used to assess changes in complexity of epistemological beliefs of mentors and mentees. Preliminary analysis of research data suggest that mentor/mentee interactions may indeed foster important changes in cognitive structures. The strongest support comes from journal data. These results add to the body of knowledge about effective supervisory processes. An appendix lists themes for support and challenge dialogues. (Contains two tables.) (SLD)

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Using Structured Interactions in Conferences and Journals to Promote Cognitive Development Among Mentors and Mentees*

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*Author Note: A paper based on preliminary analyses of these data was presented at the Annual Meeting of the American Educational Research Association, Chicago, IL, March 24-28, 1997. This earlier draft of the paper was titled: The Use of Reflection and Structured Journaling Within Complex Helping Relationships as a Stimulus for Cognitive Structural Growth.

Using Structured Interactions in Conferences and Journals to Promote Cognitive Development
Among Mentors and Mentees

Introduction and Background

The main purpose of education is to develop the mind of the learner, whether that learner is a child or an adult. Kegan¹ contends that the literature on adult learning reflects a remarkable convergence of thinking about the central intellectual mission of adult education as the development of self-directed learners. Given that development of self-directed learners is the major purpose of education, fostering such development in the adults with whom we work is certainly a laudatory goal of instructional supervisory interactions. Additionally, fostering adult development is entirely consistent with the current thinking about the type of leadership required for the new vision of schools as "learning organizations". In learning organizations, new types of expectations are placed on the adults who inhabit them, expectations that demand something more than "mere behavior, the acquisition of specific skills, or the mastery of particular knowledge."² Such organizations require adults fully able to operate from complex cognitive structures.

Reiman and Thies-Sprinthall³ have argued that cognitive developmental growth, given appropriate conditions, continues into adulthood. Their research has been premised on the idea that "humans behave in accord with the level of complexity of their mental structures" and, that "these cognitive structures are organized into a hierarchical sequence of stages from the less complex to the more complex."⁴ Similar to Joyce and Showers,⁵ Thies-Sprinthall and her colleagues believe that interventions that enhance the development of teachers' cognitive structures lead ultimately to more desirable teaching behaviors -- hence their attempts to foster such cognitive development within supervisory relationships. Their work has its roots in a considerable body of earlier research by stage development theorists, most notably Hunt,

Loevinger, Kohlberg, and Piaget, as well as in components of a developmental supervisory model proposed by Glickman.⁶

King and Kitchener⁷ have described a seven-stage model depicting the development of reflective judgment and argue that stage models of cognitive development provide useful frameworks for viewing human intellectual growth and learning. To them, reflective thinking is characterized by a view that knowledge is not a "given" but instead must be actively constructed within a specific context, and that individuals reasoning at these stages understand that conclusions must be grounded in relevant data and remain open to reevaluation. King and Kitchener argue that this kind of thinking is what Dewey called reflective thinking or reflective judgment.⁸

A line of research has been conducted by Schommer⁹ and others that views "epistemological beliefs" as a set of four relatively independent continua of beliefs about the structure, source, and certainty of knowledge as well as the source of control and speed of knowledge acquisition. Her 63-item questionnaire assesses the extent to which individuals believe that learning ability is innate, knowledge consists of isolated facts, learning is quick or not at all, and that knowledge is certain. From her perspective, individuals holding "sophisticated" views of knowledge generally believe that knowledge is constantly evolving and thus uncertain, some knowledge has yet to be discovered, and relatively small amounts are considered unchanging.¹⁰ Evidence shows that teachers' beliefs about learners, curriculum, and numerous other factors directly influence and/ or mediate classroom practice.¹¹ For example, classrooms that differ in goal orientation have an impact on the learning strategies students employ, the degree to which they seek out and persist with challenging tasks, and the attributions they make for success and failure. We are aware that teachers' fundamental views about knowledge and how it is acquired (i.e. their epistemologies) influence how reform efforts are enacted in classroom practice.¹²

Evidence also exists that preservice teachers' views about informal and formal evaluation practices are related to their espoused epistemological beliefs. What has not been systematically studied is how educators' (teachers, supervisors, counselors, etc.) epistemological beliefs might be affected by interventions deliberately designed to promote change in cognitive complexity. Since Schommer's "sophisticated" view of knowledge is consistent with how King and Kitchener¹³ describe highly developed reflective judgment, is quite similar to the higher levels of cognitive development described by Kegan¹⁴ and to the constructivist perspective of knowledge and learning offered by Brooks and Brooks¹⁵ and others, it seems reasonable to examine the utility of her epistemological questionnaire in assessing changes in cognitive complexity.

Further, considerable research shows that the levels of cognitive development of a variety of professionals are correlated with certain behaviors. For example, studies summarized by Reiman and Thies-Sprinthall¹⁶ show that for school principals higher stages were predictive of more democratic behavior with teachers,¹⁷ for teachers, higher stages were consistent with more effective teaching strategies, more empathy, more willingness to innovate,¹⁸ while lower stages were found in teachers that were more rigid in the classroom and less competent as supervisors of novice teachers.¹⁹ Similarly, reviews and meta-analyses of developmental research by Rest and Miller confirm that higher stages of moral developmental reasoning are predictive of complex professional behavior.²⁰ Based on these and other studies, Joyce and Showers argue that considerable support exists for the idea that the complexity of cognitive structures of teachers is related to their use of diverse teaching strategies and to their success in using certain innovations.²¹

A basic goal of developmental research is to identify interventions that foster development. Reiman and Thies-Sprinthall addressed this goal by asking whether interventions could be designed that promoted the cognitive development of adult learners.²² From their work,

they identified five conditions under which developmental stages of mentor teachers might be changed. These were: 1. Role-taking-- as in a significant helping relationship such as counseling, tutoring, or mentoring; 2. Reflection -- as in journaling and dialogue about the helping experience; 3. Balance -- action and reflection must be maintained in balance, neither work alone; 4. Continuity -- the intervention or helping experience must be allowed to work over a long time period, usually at least one semester; and, 5. Support and challenge -- working within Vygotsky's zone of proximal growth.²³

Study Purposes, Methods and Data Analysis

The purpose of this research was to examine the effects of structured interactions in conferences and journals on the cognitive complexity of adult educators. More specifically, we were interested in the effects of the use of specific dialogue patterns within reflective conversations and of structured response patterns in journals on the cognitive processes of mentors and mentees engaged in conferences about the professional practices of the mentee. During the 1995-96 school year, students enrolled in a graduate class in educational leadership participated as part of their course work in a semester-long research project designed to build on and extend the line of research conducted by Reiman and Thies-Sprinthall.

Eleven pairs of educators completed the project. Each pair was comprised of an educational leadership student and a partner selected from his or her work site. The participant pairs represented an interesting variety of roles. Five pairs were composed of an administrator as mentor (i.e., superintendent, principal, assistant principal, or former principal) and a teacher mentee who reported directly to the mentor, except for one case in which the administrator had previously supervised his teacher mentee but was now a peer of the teacher. Four pairs were closer to true peers (i.e., a head teacher with a new teacher, a lead teacher with a counselor, two administrative assistants in the same building, and two undergraduate college teachers from the

same department). The final two pairs were unusual in that the more novice person served as mentor within the relationship (i.e., a doctoral student with a university professor and a novice coach with a head coach).

Pre-intervention assessments of moral reasoning and epistemological beliefs were administered to all participants. Following these assessments, each participant pair engaged in a semester-long relationship, in which the mentor observed the mentee's practice and engaged him/her in a reflective conversation about the observed experience following a support/ challenge dialogue pattern. The mentee then reflected on the conference and the conferencing experience using a structured journal format to which the mentor responded, again using a support/ challenge response pattern for the written comments. The dialogue pattern and journal response pattern were taught as part of the class content. The professor monitored the quality of the mentor responses to the mentee journals through periodic review and feedback on mentor use of the structured response pattern. The mentor then completed a reflective journal entry about the experience. Five cycles of observation, reflective conversation, mentee journaling, mentor response, professor review and feedback, and mentor journaling were completed by each pair. Post-intervention assessments were then made using alternative forms of the assessment instruments: The Defining Issues Test²⁴ and the Epistemological Questionnaire.²⁵ Following completion of the project, both the mentor and mentee made a final journal entry reflecting on the overall experience. In addition the professor kept a journal throughout the study which provided still another data source.

The structured formats of the reflective conversations and journal exchanges between mentor and mentee pairs had as an underlying goal the provision of appropriate support and challenge to the mentee's thinking in order to stimulate cognitive structural change. The patterns were based on the work of Zeichner and Liston; Glickman; Sprinthall, Reiman, and Thies-

Sprinthall; Costa and Garmston; and Arredondo, Brody, Zimmerman and Moffett.²⁶ The support/challenge responses differed based on the mentors' identification of two levels of mentees' cognitive complexity -- relatively "high" or "low". For example, if the mentee made a statement in his/ her journal (or during a conference) that indicated difficulty in accepting responsibility for a student's misunderstanding of or lack of interest in a new concept or idea, such as, "Eric C. just didn't get it! I don't think he wants to learn about the chemistry of photosynthesis. His father works at Weyerhaeuser, I wish he'd just tell Eric how important this unit is," the mentor would probably assess this individual as exhibiting relatively "low cognitive complexity" and respond with a statement that provides both support and a non-threatening challenge. An example statement might be:

It sounds as if you are frustrated with Eric's misunderstandings; I know how that feels. It is difficult to understand how a senior high school student from a good family like Eric doesn't see value in learning about such an important idea. I remember one of my students becoming more interested in photosynthesis when I helped her see how the process was connected to logging in the rain forests and to decreased amounts of oxygen in the atmosphere. Do you think Eric might become excited about finding out more about such connections?

On the other hand, suppose the mentee in the above situation had said:

I noticed that Eric C. just didn't get it when we were talking about photosynthesis. I suspect that my examples were not as relevant to him as they might have been. I remember that last week on the television show, Seinfeld, the characters were discussing problems associated with logging in the Amazon Rain Forest. When we come back to the idea of photosynthesis on Tuesday, I want to make some connections between the discussion on the television show, the disappearing rain forests, industrialization, and the decreased amounts of oxygen in the atmosphere. This may help Eric to become more interested in the chemistry behind this important process.

In this case, the mentor would probably assess the mentee as exhibiting relatively "high cognitive complexity", and might respond with statements that "up the ante" by providing less support and more challenge. For example:

It sounds as if you think that Eric was just not interested in the information you wanted your chemistry class to consider, and that his lack of interest was probably attributable to the irrelevancy of your initial connections. Is that correct? What other possibilities can you think of?

And later, after exploring other options, Is it possible that Eric thinks he already knows a lot about the photosynthesis process? You remember when we were working on the science curriculum review committee last semester we discovered that photosynthesis is taught in four different grades within our K-12 curriculum. If that's the case, what do you think could be done about the lower levels of interest in the photosynthetic chemistry unit?

The preceding example illustrates the pattern of responses developed for use with the theme of "locus of control". Since less cognitively complex individuals tend to place blame for effects of actions on situational determinants beyond their control, the challenge is to lead the mentee's thinking toward acceptance of responsibility and more personal control. Other response patterns were developed around themes contained within the characteristics of the different levels of cognitive complexity described by Kegan,²⁷ Kegan and Lehey,²⁸ and King and Kitchener,²⁹ and as inferred from the writings of Schommer³⁰ and Brooks and Brooks.³¹ For example, themes of efficacy (self-doubt vs. confidence in ability or skill), perceptions of knowledge (fixed, simple vs. changing, situated), beliefs about learning (quick vs. not at all), student ability (fixed vs. changeable), teaching methods ("tried and true" vs. experimental), reflection (cursory review of actions or decisions vs. sophisticated examination of practice and development of hypotheses for connection to future practice and/ or questioning assumptions and beliefs underlying actions), perception of teaching (as isolated behavior vs. collaborative practice), and teacher development (sole reliance on school or district provided inservice vs. continuous, self-regulated, collaborative learning). Embedded in these patterns for guiding reflection are essential verbal and non-verbal communication skills, such as attention to sensory information, rapport building, pausing, paraphrasing, probing, and checking perceptions. All are used within an environment that is respectful of adult learners as individuals and likely to be conducive to their learning processes. (Please refer to Appendix A for additional illustrations of dialogue/journal response patterns.)

As described previously, following each of the mentor/ mentee reflective conferences and structured journal entries about the experience, the mentor responded to the mentee's journal

comments within the parameters of the patterns described above and prepared his/ her own journal entry. The mentor then submitted the journal entries and his/ her responses to the professor, who reviewed them for skillful use of the support/ challenge response patterns. After completion of the five cycles, these journal entries, as well as the professor's journal, were analyzed using constant comparison and other qualitative methods.³² For example, themes and categories were identified by the researchers and then collapsed to eliminate redundancies. Analysis of the rich journal data supported the somewhat limited quantitative data obtained from the pre- and post-assessments of principled moral reasoning and epistemological beliefs of the educators involved in this research effort and provided increased confidence in the findings.

The Rest Defining Issues Test or DIT³³ was used to assess changes in the level or complexity of principled moral reasoning of mentors and mentees involved in the project. The DIT is a machine scoreable situation response test that assesses how an individual analyzes critical social issues and evaluates appropriate courses of action. It is based on Kohlberg's six-stages of moral reasoning. During assessment, an individual is presented with 6 social issues (three in the shorter version) and is required to select a course of action and then rank order the principles that influenced his/ her decision. Scoring involves calculation of a principled reasoning score (P score) that indicates the relative importance of each of the identified principles to the decision. Mean pre- and post-P scores of mentors and mentees were compared using descriptive statistics.

The Schommer Epistemological Survey³⁴ was used to assess changes in the complexity of epistemological beliefs of mentors and mentees involved in the project. As previously noted, Schommer's epistemological survey consists of 63 items designed to reflect beliefs about knowledge and learning. Participants rated these statements using a 5-point Likert-type scale, with 1 meaning strongly agree and 5 meaning strongly disagree. According to Schommer, lower scores on the items signify "more sophisticated" beliefs. Because of the small number of

participants in this study, it was inappropriate to subject the data to a new factor analysis, therefore her previously determined factor coefficients were used to calculate pre- and post-factor means for mentor and mentee subgroups. Differences among these means were then analyzed using descriptive statistics.

Results and Discussion

Preliminary analyses of research data suggest that under the conditions outlined here, mentor/ mentee interactions may indeed foster important changes in cognitive structures. While the journal data provide much stronger support for this idea than do the data from either of the assessment instruments, the combined results from this study provided a strong argument to justify additional data collections -- currently underway. The three types of data collected in this research effort are reported and discussed in the following.

Journal Data. Themes emerging from the journal entries included concerns about skillful use of the supporting/ challenging response patterns during conferences, effects of the use of the structured interactions on mentor and mentee thinking, overall changes in mentor/ mentee thinking over time, and reactions to the conferencing/ journaling process itself. These emergent categories provided rich descriptive responses to four major questions of interest to the researchers: 1. How easily can this complex responding process be learned and used by current and aspiring supervisors? 2. What were the effects of use of a process of supporting/ challenging another individual's thinking on the mentors' thinking over the course of the project? 3. What were the effects of use of this support/ challenge process on the mentees' thinking over time? 4. What were the overall reactions of the mentors and the mentees to the conferencing and journaling processes used in this project? These questions are considered separately in the following.

1. How easily can this complex responding process be learned and used by current and aspiring supervisors? While varying levels of skill in using the patterned responses were evident early in the project, almost all of the mentors gained sufficient facility with the process to satisfactorily demonstrate this use during role plays of conferences in class, on audio tapes of conferences, or in their responses to the mentee journals. Initially, however, considerable apprehension about use of these skills existed. One student expressed her concerns about the skills needed to function as a facilitator of teacher growth in a journal entry made prior to her first conference as:

Just how will reflecting and journaling help me move from casual to rigorous thinking? I need to think about how I can improve each of the five or six journal responses so that I facilitate the teacher's reflections about her lesson, while at the same time strengthen my own thinking and learning. I feel that anything that can help me to efficiently/ effectively conference with a teacher concerning classroom situations is inherently worthwhile, but I also want to be able to 'lead' the teacher into true reflective assessments that can strengthen her teaching as well as my own interactions with students.

Another wrote, "I believe this will be a valuable experience for me . . . I am looking forward to learning . . . I only hope I am capable enough to do this properly and accurately." Others expressed their initial apprehension in journal entries immediately following their first conference. For example, "This was an interesting conference, as both of us, the teacher and myself, didn't really know what we were headed into," and:

Even though I looked forward to working with [this] instructor, initially it was difficult for me to be paired with her. She is a very pleasant person, and under any other circumstances it probably would not have mattered as much. However, I think that an observation and conference situation is very uncomfortable for most people. Observation usually means you're being evaluated and most people feel threatened with that. It was especially uncomfortable for me because I am not as accomplished as the instructor that I chose to observe and the process could have put her on the defensive.

At least one mentor got off on the wrong foot, however, and experienced some difficulty "relearning" a conferencing format. He wrote,

Being an experienced supervisor, I followed the PBTE (performance based teacher evaluation) process recommended by the state department of education only to find out that it really shut down the kind of conversation we were aiming for in this project. After the first conference, I found that I needed to regroup and relearn.

Another mentor (a principal) wrote more indirectly about a similar concern,

This conference was much more relaxed, after forgetting much of what I'd already learned to use. However, I do not know if I asked the right questions or challenged the mentee to think about her teaching. I am tentative about the process of supporting and challenging her thinking. It seems difficult to accomplish so much under the time constraints of the job. I do think it will get easier though.

And, of course, it did. Following the third cycle, at least eight mentors described their use of the process in positive terms, such as "much easier", "more comfortable", "almost routine", and "do-able". One wrote, "We're into it now. I can do this!"

Learning to use the support/ challenge responding process appeared to be more difficult for some of the practicing administrator mentors than for those mentors working with peers, however. Following the fourth cycle, one assistant principal continued to use directive language with her mentee, telling her what was wrong with the observed lesson, and even how to fix it. This, in spite of the fact that she had been given consistent feedback and assistance from the professor in developing more appropriate support and challenge comments. A taped conference comment and question illustrates,

You checked for comprehension and they all were able to move on. This is effective instruction. I noticed that the paraprofessional stayed with Jason throughout the lesson. While this seemed to help with him, two other IEP students also needed attention. Have you thought about asking her to monitor all three of the Inclusion students?

Apparently individuals who have developed some skill with "direction giving" and/or "controlling" patterns of conferencing may have to "unlearn" those procedures, before they are able to develop fluid use of more indirect conferencing styles.

Research by Grimmer and Crehan³⁵ supports the idea that a productive dialogue about observed teaching requires the mentor or supervisor to function in a less directive manner. For

example, they described one supervisor who did not always manage to establish an equal, trusting, and collegial relationship even with the same teacher, and that when the supervisor imposed her agenda during conferences with this teacher, the productivity of the conversation suffered. While the mentor described above appeared to the professor to have experienced only moderate change over the semester, she viewed her own learning quite differently. In a journal entry about the project, she wrote:

This has been a very gratifying piece of work. It's very satisfying to know that my time investment [in a university class project] has paid off in the growth of both a teacher and her students. My own skill in helping teachers has grown threefold. Much more so than when I finished my first supervision class. I think I've almost stopped giving advice or telling them how I would do it. I've become more proficient in getting teachers to reflect, especially this one. The growth in rapport between me and my mentee has been tremendous. She will be a terrific teacher soon and I can take at least part of the credit for that.

In considering the question about ease with which students might learn the structured interactional patterns, one caveat is important. These journal data reflect self-reported effects. Additionally, since it was not possible to maintain complete anonymity with journal entries, the described effects may have been influenced by student tendencies toward political correctness. Although adult graduate students are less likely to be influenced by what they think their professor wants to hear than are undergraduate students, that possibility cannot be ruled out. A cautious interpretation, therefore, would suggest that the necessary skills can be learned within the framework of a regular university class setting. In fact, the ease with which participants in this study learned to use the support/ challenge interaction patterns presents an optimistic scenario for current and aspiring supervisors interested in adding this process to their repertoires of conferencing practices.

2. What were the effects of use of a process of supporting/ challenging another individual's thinking on the mentors' thinking over the course of the project? Mentors observed several intriguing effects resulting from their use of the support/ challenge interactions during

conferences and journal exchanges. Four of the mentors described powerful realizations they had experienced during the project about the effects of using a more indirect conversational style rather than their usual direct style. This observation is not surprising, of course, given the long standing research about the preferences of teachers for supervisor use of indirect conferencing styles.³⁶ One wrote,

I am learning that I can gain much more by using my newly acquired skills [paraphrasing and probing] with personnel than by dictating my desires to them, which was more like my previous style. At the same time I'm learning valuable insights into their thinking that I can use for future reference. I have discovered that often times, when I allow the person to reflect and respond to my prompting, they (sic) frequently come up with a better solution than the one that I was prepared to tell them!

Another mentor described a similar conference experience with considerable surprise, describing his mentee's responses to what he believed were indirect paraphrases and probes as if they were "direct orders for certain actions." For example:

I found it interesting that in his [the mentee's] journal when he addressed each of the topics I had asked questions about and attempted to challenge his thinking on, he implied that I pointed out problems and told him to work on them (see p.3 of his notes). This indicates to me that, even though I was asking what I thought were gentle questions, paraphrasing, and supporting his thinking, that he still perceived how I really felt about the topics we discussed. In actuality, he stated what he should do in every case. I would never have guessed that such an indirect style could be so clearly directive! In this case, at least, I certainly would never have to actually direct him to do something. This experience has caused me to really think about how I should give directions in the future.

Mentors typically described the effects of using the support/ challenge process within the mentor/ mentee relationship as having considerable impact on their own thinking. For example, "My thinking has gone through unbelievable changes through this experience. I have learned and experimented with skills that I had no idea I could do and I see limitless applicability of them in my other administrative tasks -- particularly with board members." One of the lead teacher mentors wrote:

Talk about tough challenges to my thinking. I believe that I could have met my goals for cognitive structural change following just one of the conferences I had with my mentee. In my

third conference I explored possibilities with the teacher for dealing with a behaviorally disturbed student who obviously had MANY problems. She had clearly thought about most of the "possibilities" that I suggested and had predicted some of their probable outcomes for the student. She explored other ideas with me that challenged my basic beliefs and assumptions about special education students. I do so admire her patience. I know that even though I'm supposed to be the lead teacher here and this is her first year, she's no novice to understanding special needs children. Isn't reflection a wonderful thing? And the power of these reflective conversations . . . Wow!!

Another mentor wrote about the powerful effects of the interaction process on his/her own thinking:

Reflective journaling and conferencing as we did in this class has certainly changed the way I think about communicating with other professionals. Suddenly I realize the importance of knowing real perceptions about the issues being discussed. The style that I had developed prior to this project had been pretty successful, or so I thought. . . . I believe that I will be a far more effective educational leader as a result [of the project]. Has my cognitive complexity changed? I think it has. But I can't wait to find out what the other assessments show.

A second theme that surfaced here was trust. Several administrator mentors described their surprise at the effects of the conferences on their mentee's trust and confidence in them as administrators. Toward the end of the project one of the principals wrote:

My mentee came to me a few days ago with a concern about a particular student. I do not think she would have done so before this project. I would like to think that all the teachers in my school are that comfortable. But they probably aren't. The journal exchanges and conferences this semester have changed all that, at least for this teacher, especially the strategies and techniques we used. They probably have nurtured more trust and rapport than some of my other practices. This continues to surprise me. As I reflect on my role as a principal and on how my thinking has changed over the years that I have been in this building, I can see a definite impact.

A second mentor wrote about the trust that had developed in the following way:

I attempted to 'up the ante' (as you often say) and to utilize this support/ challenge process to engage my mentee in reflection about personal strengths and weaknesses and how these fit into her professional development goals. I was amazed at how easily this happened. The conferencing is almost routine now. We are both relaxed and it is apparent that we trust each other.

The effects on mentor thinking were not overwhelmingly positive, however. One mentor, who experienced less success with the interactional format than his classmates and was therefore less enthusiastic about it, wrote,

Probably the best thing about this process is that it allowed me to think about how I handle parent-student conferences myself. After watching my mentee, I now feel that I need to demonstrate greater warmth toward the people involved and to pay less attention toward the problem. I am trying to move away from the position of telling parents and students what they need to do and more toward creating reflection on how they can obtain the goals they want.

This mentor was an administrative assistant and had selected another administrative assistant in his building as his mentee. He observed his colleague's discipline conferences as the professional practice portion of the mentor/ mentee relationship, and then conferenced with him about those meetings with parents and students in conflict situations.

Changes in mentors' thinking about the use of indirectness in conferences, the power of an insightful paraphrase or a thoughtful probing question, and the ease with which trust can be developed in relationships that result from meaningful interactions about professional practices were clearly evident in mentor journals. These reported effects on the mentors' cognition parallel the descriptions of observed changes in coaches' thinking presented by Costa and Garmston,³⁷ and they provide empirical support for observations and arguments offered by several researchers in the field that during reflective conferences with teachers, supervisors' knowledge and understanding of teaching and learning is enhanced through the collaborative inquiry into the teaching process.³⁸

3. What were the effects of the mentors' use of a supporting/ challenging interaction process on the mentees' thinking over time? Effects on mentee thinking were more difficult to assess through the journals because the structured format they used contributed to brief entries and also because of the limited number of journal entries collected from the mentees. However, a few of the mentees did write more expansively about the effects. For example, one wrote, "The most helpful thing about the conferences is just the opportunity to think once again about my unresolved dilemmas of teaching. There is always something to learn from this reflection, and I can get so focused on content and group activities that I do not think about my specific teaching

behaviors." Another comment from this same mentee illustrated her response to the support/challenge pattern being used by the mentor:

I thought your honing in on the same issues that had bothered me was helpful. It made a good debriefing from the teaching experience. It made me think about why the "mistakes" I felt self-conscious about had happened. These are things in my control, that are chronic to the class because of decisions we have made and can unmake. So many of the times we blame students for things that don't work, but there are always things that I can do to adjust. Your conferencing style helped me realize that.

Another mentee reported, "[It's] just that I found this surprisingly helpful. I have been very busy this semester, and [when this happens] my teaching is in danger of not getting the attention it deserves. The conferences help remind me why I care about it so much." A mentee who was a beginning teacher wrote, "This conference has given me so much to think about. Since I am a first year teacher, I'm starting at ground zero. It is very helpful to talk about a lesson like this with an experienced teacher. Sometimes after our conferences, my head is just bubbling over with ideas."

An interesting set of interactions occurred through the journal between the mentor/mentee pair who held lead teacher and counselor positions in the same middle school. In this case, the teacher mentor observed parent conferences held for students in danger of being retained in the sixth grade and conferenced with the counselor about these retention conferences. The teacher assessed the counselor's cognitive complexity as relatively high and consistently challenged her counselor mentee on several issues, especially including the students and the core teachers in the conferences. The counselor originally opposed including both the student and the core teachers and wanted to continue the format of conferencing with just her and a parent in attendance. The mentor suggested that the counselor think about the issue during both of the early conferences and by the third conference she agreed to include the students. The results of having the students included then led to her willingness to include the core teachers. Her journal

comments indicate considerable change in attitude toward the teachers of the failing students and also toward the parents. In one early journal entry she wrote, "Do the parents and the students understand the seriousness of these retention conferences? Don't the parents want their kids to do well? Do they understand me? Am I communicating this well enough?" Toward the end of the project, however, she wrote,

The main learning I made from my practice this week was that most of the teachers in this school do want their students to grow and succeed. Most . . . are not out to play "gotcha" as I sometimes imagine. The teachers acted in a professional way and were very helpful in finding a solution to the students' problems. I am glad that you persisted on this point.

Other effects on mentee thinking were reported by the mentors, usually through their journal comments. For example, one mentor wrote, "The teacher also told me at the end of the conference that even though she knew that I was using this conferencing style as a class project that the conferences were very motivating to her and that she found herself thinking about challenging her students' thinking more." Another reported that he and his mentee had discussed the possibility of continuing the observation and conferencing cycles as partners during the following semester only alternating the roles. "We both believe this can be an effective method to stimulate reflection and hence improve teaching." Still another wrote about his disappointment with not being able to get his mentee to write at length in the reflective journal. He wanted to work on improving his reflective dialogue skills because he thought their use even without the journal reflections would also be very meaningful. And finally, an assistant principal mentor wrote, "My mentee has really made a 'boatload' of improvements in all areas. We've come so far on the behavior management and lesson design issues."

4. What were the overall responses of the mentors and the mentees to the conferencing and journaling processes used in this project?

A number of broad general responses to the support/ challenge conferencing and journaling processes between mentors and mentees were observed and/or reported. Probably the most interesting was the change over the course of the semester in mentor reflection as evidenced in their journal entries about each cycle. Four of the mentors' final journal entries exhibited characteristics of the upper stages of reflective judgment as described by King and Kitchener.³⁹ Since mentor cognition was not formally assessed with the King and Kitchener Reflective Judgment Interview,⁴⁰ it is not possible to label the exact stages of reflective judgment exhibited, however, statements reflecting a view of knowledge as contextual, combined with justifications of beliefs were evident. For three of these four mentors such statements had been absent in early journal entries. Of the four mentors exhibiting this level of reflection, one was a practicing administrator whose mentee was a teacher he supervised. The remaining three mentor-mentee pairs were colleagues and peers within the same schools or college. The fact that only one of the administrator mentors was among the four exhibiting this level of reflection may lend support to the idea that colleagues or peers tend to be more successful in establishing the trust and collegial relationships so essential for growth during conferences.⁴¹

Evidence of higher levels of moral reasoning as described by Rest⁴² were also evident in the final journal entries. Since according to King and Kitchener the structural development of moral reasoning and reflective judgment are similar,⁴³ this was not surprising. One example is clear in the following journal comment made by a lead teacher mentor:

This group of kids needs so much. They are at a crossroads of their lives...and I wonder if the school can help them, or will [they be left to] society? What does the future hold for them? Their options in life will be so limited. I feel the ball is being dropped here. . . The techniques we are expected to use just don't seem to work. What is the morality in that?

Of the remaining mentors, four appeared to exhibit moderate change in reflection levels. For example, statements reflecting a transition from simple recall of experiences or connecting the

experiences to new content knowledge, to examinations of the assumptions being made during the experiences or to beliefs about student abilities and how they learned were evident. These four mentors appeared to be "stuck somewhere in the middle of the reflective hierarchy" as one of the professor's journal entries noted. Three other mentors appeared to have experienced little or no change in their levels of reflection. Their journal entries remained little more than cursory and perfunctory responses to the queries and suggestions made by the professor during her regular review of journals. These lower levels of reflection were frustrating to the professor. She commented in one journal entry:

I have continued to be unsuccessful in supporting and challenging at least two of my students so that they engage in higher quality reflections. Perhaps either the support or challenge that I provide is not 'hitting their zones of proximal development' -- or maybe I don't know quite enough about this process yet, either. In any case, we're not there yet. I think that my belief that one of the students is somewhat lazy, that he just doesn't want to do much beyond the minimum, does get in the way of my provision of the right types of support and challenge statements for him. But what about the other one? What am I assuming about him?

Overall responses to the interactional processes in conferences and journals from the mentees while limited, hold important implications for the teaching and learning of instructional supervision. For example, mentees described the "excitement" of being able to reflect on classroom practices, about "how helpful to their teaching" these reflective conversations were, and about how "different this style of 'instructional supervision conference' was from the usual performance based teacher observation conferences that s/he had experienced in the past." Mentor comments also contained helpful ideas for teaching and learning. They commented about how deeply they had "learned the content material from the embedded use within a real project". One mentor described this project as being "one that really mattered, not at all like the one I did in my first instructional supervision class." The professor's journal also reflected this excitement and described how the "mentor and mentee responses" had enlivened her teaching."

In summary, the journal data show that the complex interactional support/ challenge process can be learned within the structure of a regular graduate level university course, even though it may be somewhat easier for novice administrators to construct knowledge and skills for fluid use of the conferencing process than for more experienced ones. Mentors were surprised that indirect conversational styles may be more powerful than the direct styles they had previously used; and, almost all of the mentors, as well as several mentees, described the structured interactions as having a tremendous impact on their thinking. Mentors were intrigued that trust was as easily developed within the conferences as it had been, and mentees seemed to feel less threatened than they did by the more usual performance based teacher evaluation conferences that they had previously experienced. One of the more important overall responses to the support/ challenge process was the apparent change in levels of reflections experienced by about two-thirds of the mentors and several of the mentees. Journal descriptions of these changes lend credence to changes suggested by the epistemological beliefs assessment data (discussed below). Implications for the teaching of instructional supervision were also identified.

Moral Reasoning Assessment Data. A major goal of this research project was to assess cognitive changes of mentors and/or mentees as a result of their engagement in a semester-long relationship during which they interacted about the mentee's professional practice in a structured way. The Rest Defining Issues Test or DIT⁴⁴ was used to assess changes in the level or complexity of principled moral reasoning of mentors and mentees involved in the project. Participant responses were scored and P scores (principled reasoning scores) calculated. Mean pre- and post-P scores of mentor and mentee subgroups were then compared using descriptive statistics. No significant differences were found between means of pre- and post-test scores on the Defining Issues Test (DIT) for either mentors, mentees, or both groups taken together ($p>.29$). Some intriguing anomalies occurred with the scoring, however. For example, among

the mentors, in spite of the fact that they had a higher mean post test score (post = 39.5; pre = 35.59) and a smaller standard deviation, their maximum score for the post test was 13 points lower than the pre-test maximum score (post = 48.3, pre = 61.7). It is also interesting that among the mentees, the post-test score mean (32.1) was lower than the pre-test mean (39.1). In this instance the mean was coupled with both a higher maximum score (66.7) and a lower minimum score (16.4). Because of the small sample size, peculiarities in individual scores were not masked, and more than likely produced overly dramatic effects on the outcome. However, even though efforts were made to reduce errors in handling data, it is possible that some problems were introduced at the data collection stage of the project. Although Reiman and Thies-Sprinthall⁴⁵ reported significant changes between pre- and post- DIT scores under similar conditions, none were found in this study. It is possible that the intervention did not lead to significant changes in principled moral reasoning of either the mentors or the mentees. Given that the DIT is an instrument that has a long and consistently reported record of reliability, it seems unlikely that it is an inappropriate measure of cognitive change. Data collected from a larger sample may help explain why the expected growth outcomes were not found in this study.

Epistemological Beliefs Assessment Data. As a second measure of cognitive growth, Schommer's Epistemological Questionnaire was used to assess changes in beliefs about knowledge and learning. Participants rated the 63 items using a 5-point Likert-type scale, with 1 meaning strongly agree and 5 meaning strongly disagree. According to Schommer, lower scores on the items signify "more sophisticated" beliefs. Since the sample size was small and Schommer had suggested that the factor coefficients from her 1990 study be used with sample sizes less than 300,⁴⁶ her factor coefficients were used to calculate pre- and post-test factor means for mentor and mentee subgroups. Differences among these factor means were then analyzed using

descriptive statistics. Using the loadings from her study, no significant differences were found between pre-test and post test scores on the four factors for either the mentors or the mentees.

However, because of the exploratory nature of this research and because of differences between the sample populations in Schommer's earlier study and this study, it seemed reasonable to examine the subset scores within the four factors. While Schommer has confirmed the existence of a four-factor structure among at least one other adult population,⁴⁷ participants in this study had considerably higher levels of education than did the population in her study. She described that population as, "One third of the sample of adults had no more than a high school degree. Another third of the sample had no more than an undergraduate degree. The remaining portion of the adults sampled had been exposed to post graduate education."⁴⁸ Education levels of the adult participants in this study ranged from a bachelor's degree plus 30 or more credit hours to the post-doctoral. Analysis of variance of the mean pre- and post test subset scores revealed significant differences on six of the ten subsets for mentors and on seven of the ten subsets for mentees (Tables 1 and 2). Profound differences between pre-test and post test scores for both mentors and mentees ($p < .00001$) were evident in some of the subsets: "Don't criticize authority," "Avoid integration," "Can't learn how to learn," and "Success is unrelated to hard work." Other significant differences ($p < .01$, $p < .05$) were found for the subsets: "Learning is quick," "Learn the first time," and "Concentrated effort is a waste of time." All but one of these seven subsets are concerned with a view of learning as "quick, or not at all," therefore the observed changes between pre-test and post test scores were all in the expected direction, i.e., from a less sophisticated view to a more sophisticated view. This change would be a logical one because during the intervention the subjects were engaged in activities that were predicated on a more sophisticated view of learning. Here, too, the sample size dictated severe constraints on

quantitative analyses of the data. Analysis of the additional data collections should prove illuminating.

Conclusion

An important role of school leaders today is the development of the "human capital" s/he manages. Reform agents continue to argue that fostering the adult development of educators is a defining action of those leaders of schools that are successfully functioning as learning organizations. Although supervision as a field of study has been criticized for lacking a sound theoretical base, the cognitive development of teachers is of primary importance to instructional supervisors. Reviews of research on adult learning show that cognitive stage levels tend to be relatively stable over time. Researchers, however, have for some time been interested in the identification of interventions that show promise in fostering change in cognitive stage levels. The results reported in this study lend support to the conclusions of other researchers about the conditions under which cognitive development may be promoted. In addition, they add to a growing number of studies that describe components of effective supervisory processes (e.g. structured reflections, challenging collegial dialogue about teaching and learning, supportive adult learning environments). As studies such as this one are reported, researchers will move closer to unlocking both "the potential of developmental growth as well as the complexities of a needed theory of supervisory assistance."⁴⁹

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Table 1

Epistemological Survey Subset Scores - Analysis of Variance of Pre-test and Post test for
Mentors

Subset	Mean		F
	Pre-test	Post test	
Avoid ambiguity	3.34	2.92	3.66
Knowledge is certain	3.03	2.72	1.80
Concentrated effort is a waste of time	2.88	2.63	0.86
Don't criticize authority	2.89	2.26	25.98 ****
Depend on authority	3.08	2.90	1.21
Learn first time	2.92	2.40	4.41 *
Ability to learn is innate	2.81	2.65	0.45
Avoid integration	3.32	2.33	30.69 ****
Can't learn how to learn	3.85	1.98	113.66 ****
Learning is quick	2.88	2.07	13.97 **
Seek single answers	3.14	2.95	2.25
Success is unrelated to hard work	3.58	2.06	41.08 ****

* $p < .05$ ** $p < .01$ **** $p < .00001$

Table 2

Epistemological Survey Subset Scores - Analysis of Variance of Pre-test and Post test for
Mentees

Subset	Mean		F
	Pre-test	Post test	
Avoid ambiguity	2.90	2.55	1.99
Knowledge is certain	2.99	2.61	3.18
Concentrated effort is a waste of time	2.92	2.42	6.83 *
Don't criticize authority	2.82	2.07	35.25 ****
Depend on authority	2.96	2.63	2.86
Learn first time	2.83	2.00	15.57 ***
Ability to learn is innate	2.67	2.48	0.56
Avoid integration	3.10	2.17	29.66 ****
Can't learn how to learn	4.02	2.13	57.50 ****
Learning is quick	2.78	2.22	5.47 *
Seek single answers	2.96	2.63	2.80
Success is unrelated to hard work	3.88	2.27	47.71 ****

* $p < .05$ *** $p < .001$ **** $p < .00001$

Appendix A
Themes for Support/Challenge Dialogue

Less Cognitively Complex

Locus of control

1. Blames others or situations.

Self-efficacy

2. Seeks evaluations or judgments of others.

Perceptions of knowledge

3. Knowledge consists of sets of discrete and known facts and concepts.

Beliefs about learning

4. Learning is quick or not at all.

Student ability

5. Student ability is determined at birth.

Teaching methods

6. Tried and true teaching methods work best.

Perceptions of teaching

7. Teaching consists of isolated behaviors between teachers and students.

Teacher development

8. Teacher learning consists primarily of district inservice activities.

Teacher reflection

9. Review of actions or decisions.

Arredondo & Rucinski, 1997

More Cognitively Complex

Accepts responsibility and seeks components that he/she can control.

Self-evaluative.

Knowledge is complex and constructed to fit within specific situations.

Individuals can learn almost anything if they work at it.

Students can learn how to learn.

Teaching methods can/should be adapted to fit individual students.

Effective teaching is a collaborative practice.

Teacher learning is on-going and self-regulated.

Examination of practices, assumptions, and beliefs.

Appendix A
Dialogue Pattern: Self Efficacy

Less Cognitively Complex

Mentee: "I've never used the Reciprocal Reading Strategy before, and I'm really worried about my understanding of it and about my ability to use it correctly. Do you think it is appropriate to use in this situation?"

Mentor: "Learning to use new strategies is scary, isn't it? I know that you've just attended a workshop on Reciprocal Reading and that you are very excited about using it with your students. Tell me about your thinking as you decided to use the strategy with this particular lesson."

More Cognitively Complex

Mentee: "I've never used the Reciprocal Reading strategy before and I'm a bit nervous about how it might go in this situation. I've decided to use it because I think two or three of the students, especially Alicia and Ted, will really like playing the 'teacher role'. I'll be interested in finding out how they respond."

Mentor: "It's always exciting to experiment with new strategies, isn't it? What specific responses will you be looking for, especially from Alicia and Ted, that will indicate that your choice of the strategy in this situation is a good one?"

Appendix A

Dialogue Pattern: Perceptions of Knowledge

Less Cognitively Complex

Mentee: "In this lesson, students will be learning how to do genetic problems, i.e. predicting the genotype and phenotype of offspring. I will first demonstrate several types of inheritance patterns on the board and then most of the remaining portion of the class time will be spent with them working out the inheritance patterns. I believe it is really important that students learn the steps in solving these genetic problems almost without thinking. I want them to just automatically see the symbols for the parent genotypes and recall the steps in solving this type of problem. They can only do that if they practice solving dozens of problems and get the steps internalized."

Mentor: "Having students quickly solve the genetic inheritance problems is important to you. Your primary concern seems to be that your students will internalize the steps for solving the problems easily or 'almost without thinking' as you said. How is this desire for fluency in use of the steps related to your belief that if students can quickly solve the genetic problems that they will then understand the importance of genetic knowledge to medicine, law, or society in general?"

Arredondo & Rucinski, 1997

More Cognitively Complex

Mentee: I want students to understand how solving genetic problems based on patterns governing the inheritance of simple characteristics can contribute to medical knowledge, such as how certain diseases are predictable among offspring of parents with specified genotypes. Therefore I'm going to show them how basic inheritance patterns are figured out through genetic problems and then based on background descriptors, I'm going to ask that they use this new knowledge to investigate how several diseases such as Sickle Cell Anemia are inherited. They will be introduced to the genetic inheritance patterns as a way of getting them intrigued enough to develop the knowledge needed to solve the specific problem assigned to their team.

Mentor: "It seems as if you want your students to learn something about the thinking that geneticists use in solving problems such as giving advice based on predictions made from using patterns of inheritance. So you have decided to allow your students to actually figure out patterns behind some of the more familiar diseases. Are you assuming that after each team has developed considerable knowledge about how their disease is inherited that they will then be able to understand the inheritance patterns of other diseases?"